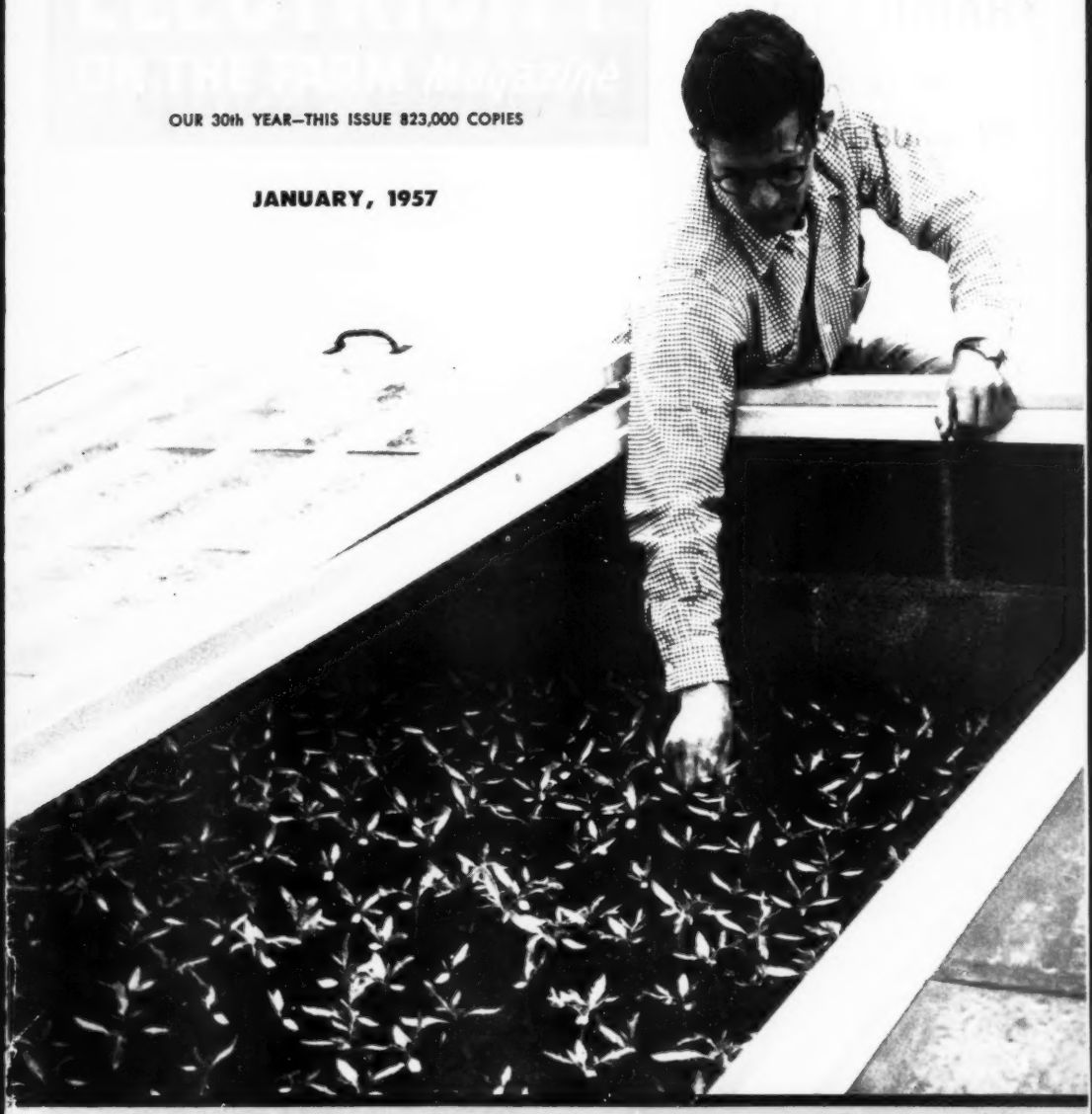
OUR 30th YEAR—THIS ISSUE 823,000 COPIES

JANUARY, 1957



David Smith of Greenwood, Virginia starts tomato plants in January to give him a "real early" plant for greenhouse production. These three-week old seedlings have been grown in his 6 ft. by 120 ft. plant bed heated with soil heating cables. For further details of his tomato enterprise, see page 10.

Let's Look at Lighting . . . . page 12

Questions and Answers on Bulk Milk Cooling . . . . . page 6

1957

BUYER'S GUIDE

of

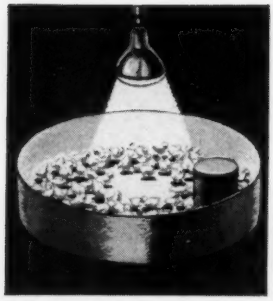
FARM PRODUCTION EQUIPMENT

and

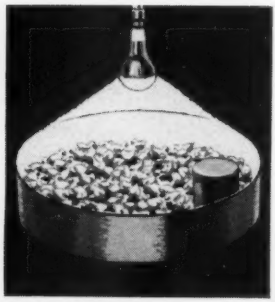
HOME APPLIANCES

Now! New General Electric Infrared Brooder Lamp

...COVERS 4 TIMES THE AREA—COSTS ONLY 75¢



CONVENTIONAL R-40 SPOT—Until now, brooder lamps focused the infrared energy downward to a "hot spot". They provided just a narrow beam of heat—enough for 80 to 100 chicks.



NEW FLOOD TYPE—General Electric's new Infrared Brooder Lamps have a wide beam of uniform warmth that covers 4 times as much area as other types. Provides for more chicks.

LOOK AT THESE FEATURES!

1. Flood type beam pattern covers four times as much area as regular R-40 type infrared lamps—serves more chicks.

2. Developed by General Electric especially for brooding chicks.

3. Costs much less than R-40 type lamps—yet they are interchangeable in existing equipment.

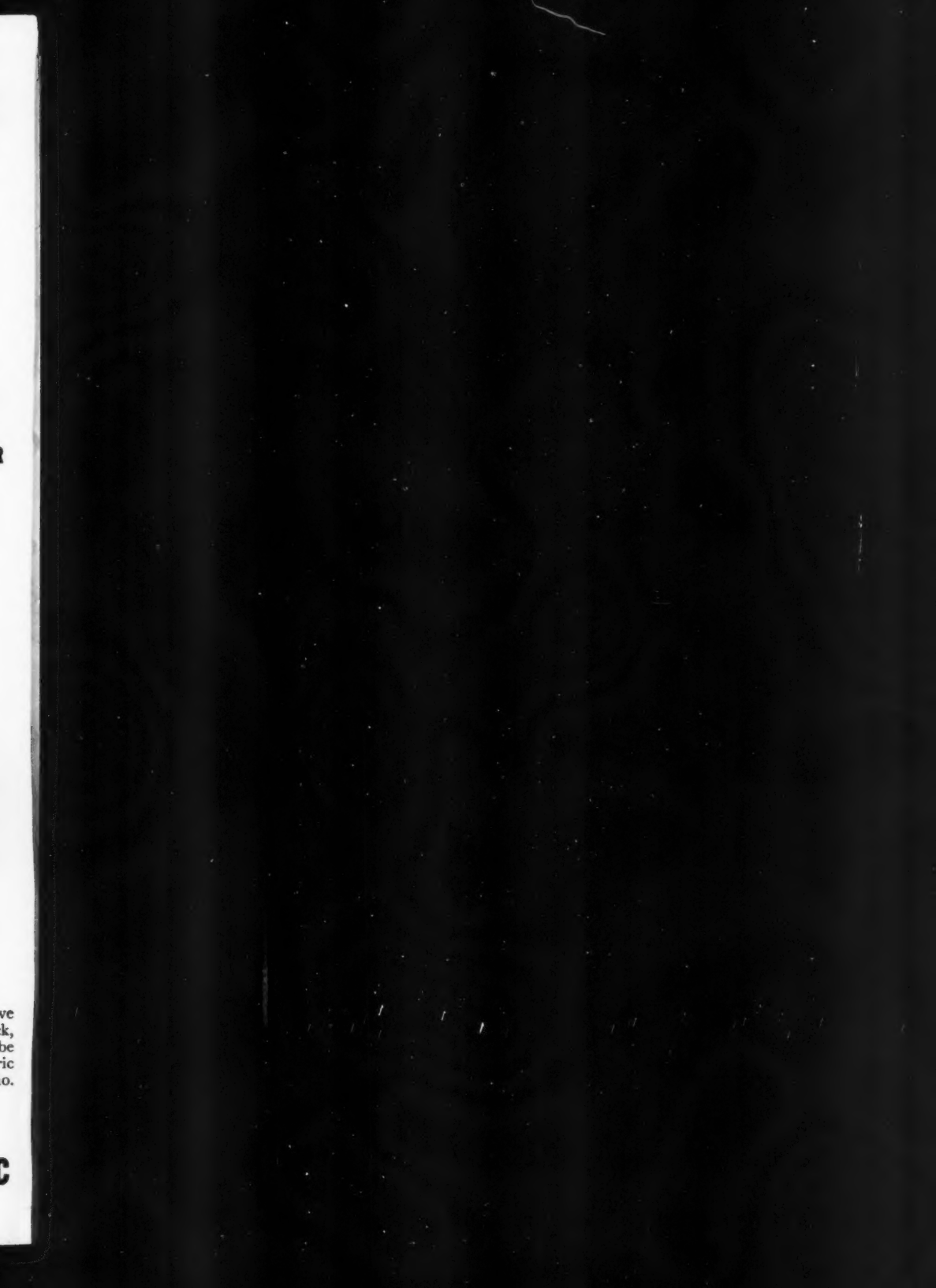
4. Wide beam pattern gives flexibility to let you economically adjust to temperature conditions.

5. Clear bulb eliminates diffusion losses you get with heavily frosted bulbs.

Since it distributes the same amount of heat, over a wider area, the new 250-watt General Electric Reflector Infrared Brooder Lamp is particularly effective for brooding older chicks and larger animals that require less heat. For younger chicks, this long life lamp (over 5000 hrs.) can be mounted lower than the conventional R-40 without getting a "hot spot". Now is the time for you to use this safe, economical source of warmth for your chicks. If your favorite dealer does not yet have new G-E 250PS 30/33 *Infrared Brooder Lamps* in stock, ask him to order them. Your local power supplier will be happy to provide more information. General Electric Large Lamp Dept., Nela Park, Cleveland 12, Ohio.

Progress Is Our Most Important Product

GENERAL ELECTRIC



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Editor's Chat

HAPPY NEW YEAR

A Happy New Year to all of you! With all the new appliances for the home, power equipment for use in the barn, poultry house, shop, and the fields, we have most everything available to make 1957 a very happy and successful year.

It is our New Year's wish and intention to do all we can to find and bring to you information on all electrical equipment that is new and good. As you put the ideas we publish into practice, we are sure it will mean a more successful year of farming for you.

HAVE YOU A "SUEZ CANAL"?

A lot of people in this world have taken the Suez Canal for granted and have given little thought to what might happen to them if this "bottleneck" of commerce should become inadequate for the traffic or be shut off altogether. Recent developments closing the Canal have brought this into sharp focus.

In a way, the electric circuits that serve our homes and farms are like little "Suez Canals." There is a lot of power at one end which we need and want to use and an endless number of ways to use it at the other end. But the canal of wires has become inadequate for the traffic we want to put on it and often breaks down.

Don't let this happen to you. There is very little you and I can do about the real Suez Canal but there are ways and means to make sure the bottleneck of wires that carry our own electric traffic are adequate and are kept up-to-date. You can't do it with a shovel or a dredge, but you can do it with planned wiring and it will pay its own way.

GET "DUMB WAITERS" FOR YOUR BARN

Some of us may recall the time when the more fashionable homes were several stories tall. Those were the days when hired help was plentiful and inexpensive. And legs were sturdy and backs were strong.

In those days two items were considered the ultimate in "automation." One was a dumb waiter. It was operated by pulling on a rope over a pulley to carry trays of food up to the dining room and dirty dishes down. The other was a "who's it" or tube with a whistle at each end so one could blow the whistle to attract attention, and then talk through the tube from one part of the house to another. You can still find them in the entrance of some old apartment buildings.

Those days are gone and most of us save our legs and backs as much as we can. One way to do it is to put a "dumb waiter" in your barn in the form of a silo unloader, feed belts to carry food to the cows, and a gutter cleaner to do the work of the "bus boy." This is becoming not only fashionable but almost a necessity.

Jim Ridout

1956 Editorial Index Now Available

Our index of editorial material published in 1956 is now available to you simply for the asking. It lists all the subjects covered during the year.

If you would like a copy of this index, just drop us a card or letter requesting it.

Subscription rates: $1.00 per year; $2.00 for 3 years; $3.00 for 5 years. 10c per copy. Bulk rates on request. Accepted as controlled circulation publication at Dayton, Ohio.

ELECTRICITY ON THE FARM *Magazine*

JANUARY, 1957—VOL. 30, NO. 1

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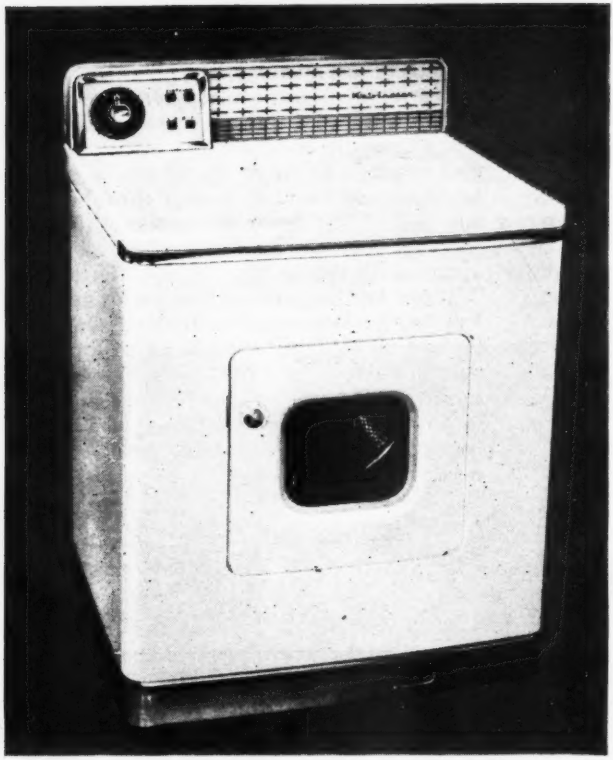
NOW, DRY CLOTHES IN ANY WEATHER, AS FAST AS YOU CAN WASH THEM!



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End Weather Worries Forever

1957 Kelvinator
the only
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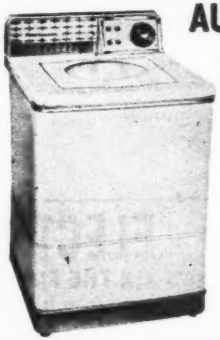
that gives you
SUPER-SPEED
with
TRIPLE SAFETY

Now solve all your drying problems with the Kelvinator super-speed, triple-safe dryer that dries clothes as fast as they are washed. It's the only dryer with all these three big safety features: Safe Temperatures; Safe Cylinder; Safety Door.

And . . . you can solve your toughest farm washing problems with the Kelvinator Automatic Washers that have the amazing "Magic Minute." It's a new way to wash everything cleaner.

Now available in three customer-approved colors, at your Kelvinator Dealers.

MATCHING NEW 1957 KELVINATOR AUTOMATIC WASHER



with the **"Magic Minute"**

60 Seconds of Automatic Pre-Scrubbing, Washes Everything Cleaner.

2 Complete Automatic Cycles. Suds Back (for suds and water economy). Push Button Water Temperature Selection.

Kelvinator DETROIT 32, MICHIGAN

How To Prevent Pump House Freezing

Well-Insulated Building Plus Automatic Heater Provides Positive Protection

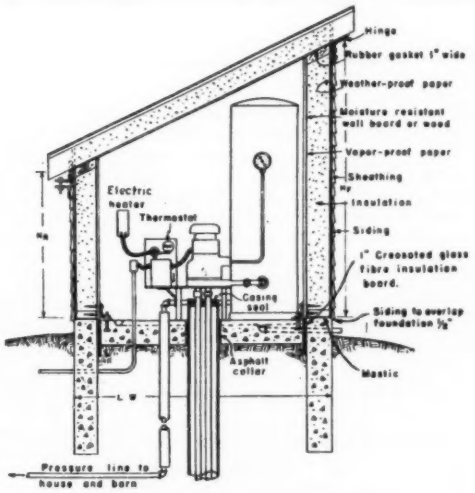
In our cold northern climate, a pump house must be built tightly and must be well insulated. Such building construction will save as much heat as possible from the water itself. In addition, some positive means of supplying supplemental heat must be provided during the extremely cold periods of weather. On the Robert Barr farm near Warren, Minnesota, an automatic electric pump house heater has been installed and does this job very nicely. Because electric heat requires no oxygen, it is ideally suited for use in such a small, totally enclosed structure. It provides constant, easily controlled heat from a unit that requires a minimum of space.

The pump house on the Barr farm measures 6 x 6 by 6½ feet high. The building is of frame construction with ¾-inch insulating sheathing and drop siding on the outside. Blanket insulation was used in the walls. Inside walls are made with fir flooring material. The floor is concrete.

A deep well jet pump supplies water for the farm and the grade A dairy. Failure of the farm water system would be a hardship at best. It is imperative that all precautions be taken to keep the farm water system in operation. As the pump house is one of the most vulnerable points at which freezing might occur, a dependable heater is needed. It should also be thermostatically controlled for economical operation.

The heater Barr has installed is a self-contained unit. The thermostat and heating element are built into one unit. The thermostat bulb is located outside of the assembly where it will contact air at room temperature. It also has an adjusting knob for easy temperature control. The heating element is rated at 500 watts. In operation the element does not glow. The heat is transferred to the air from the relatively large cast aluminum fin area of the heater. Electrical connections are made by running a three-conductor cable from the fused switch box to the unit. —PAUL A. EDMAN

Barr's 500-watt, thermostatically controlled heater is mounted on the back wall of his insulated pump house.



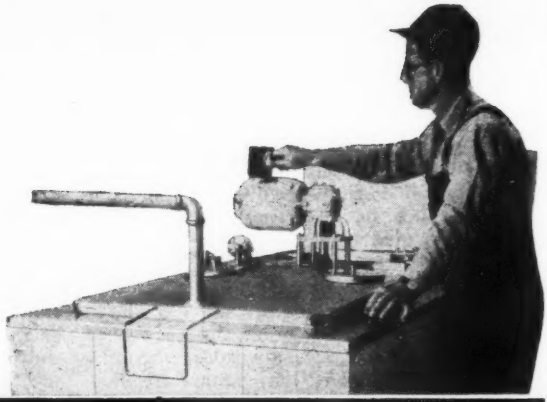
Pump House Specifications

Capacity of Pressure Tank (Gallons)	*Approx. Tank (Dimensions)*	*Suggested Dimensions of House* *L	**W	†HR	††HF	*Supplementary Heating (Watts)*
33	18" x 30"	5'	5'	1¾'	3½'	300
42	16" x 48"	5'	5'	3'	5'	300
66	18" x 60"	5'	5'	3½'	6½'	300
82	20" x 60"	5½'	5½'	4'	6½'	500
100	22" x 60"	5½'	5½'	4'	6½'	500
120	24" x 60"	5½'	5½'	4'	6½'	500
220	30" x 72"	6½'	6½'	5'	7½'	500

*L indicates length of pumphouse
**W indicates width of pumphouse
†HR indicates roof to ground distance, rear of pumphouse
††HF indicates roof to ground distance, front of pumphouse

Here are the plans and specifications for a typical pump house design to be used in conjunction with the type of heater Mr. Barr used.

Questions and Answers on



BULK MILK COOLING

By L. A. BROOKS*

Bulk handling of milk is on a steady increase throughout the country. There were 30,330 bulk milk tanks in operation on dairy farms in the United States as of January 1, 1956 according to a survey by the National Association of Dairy Equipment Manufacturers, and the figure is continuing to grow. This new system of handling milk on the farm involves quite a change for the dairy farmer. Here, we have attempted to answer some of the more common questions he will have regarding bulk handling of his milk.

Will a bulk milk tank save labor?

A bulk milk tank in itself will not save much time, but it does eliminate the work of handling cans. However, to offset the saving in time of handling cans, it is necessary for the farmer to wash and sanitize the bulk tank. This task will take about 10 minutes per day.

There may be a considerable saving in time when a bulk tank is used in connection with a milk pipeline as then all handling of the milk by hand is eliminated. The amount of time saved here increases with herd size.

How should a farmer determine the size of bulk tank to buy?

First of all, the local milk plants should be contacted to find out whether they will have every day or every-other-day pickup. It is not possible to use a tank for every day pickup that was designed for every-other-day pickup because the compressor will not have capacity for cooling the milk fast enough.

The prospective buyer should look into the future at least 10 years and try to estimate any possible expansion in the size of his dairy herd. Then he should select a tank of adequate size to hold that estimated increased production. One rule-of-thumb guide is to use a tank that will hold three milkings for everyday pickup and five milkings for every-other-day pickup. Milk production should also be leveled off to a relatively uniform rate throughout the year. The tank must be large enough to hold all milk produced during peak periods.

What milkhouse alterations may be needed?

If the present milkhouse is large enough and in good condition, the changes are likely to be minor and relatively inexpensive. It is usually necessary to rearrange some of the equipment in the milkhouse.

In some cases it may be necessary to enlarge the milkhouse or build a new one because it is not possible to get sufficient clearance around the tank. The front of the tank must have at least 36 inches clearance to other equipment or a wall. The minimum distance from face of outlet valve to a wall is 24 inches. There must be 18 inches clearance between the rear side of the tank and wall and between the compressor end of tank and wall. Check with local dairy plant fieldman on these tank clearances as the requirements vary.

What considerations must be given to the outside dimensions of tank?

The width and length of the tank is especially important in a small milkhouse where it may not be possible to obtain the minimum distances required between the tank and walls with certain models. The selection of a certain make or model of bulk tank in some cases could avoid the need for enlarging the milkhouse. The least dimension in height or width of tank is also critical in regard to getting it through the present door.

The height of the tank is not so important when used in connection with a milk pipeline but should certainly

*Mr. Brooks is Project Leader of the Electric Research Farm Agricultural Engineering Department, University of Wisconsin.

be considered when the milk is poured into the tank by hand. Bulk tanks vary in height from about 32 to 42 inches and the lower models make it much easier for pouring milk and for cleaning.

Will there be much saving of milk lost from stickage in cans?

The losses from milk stickage varies with the rate at which the cans are emptied at the milk plant, but is not as large as sometimes claimed. The milk stickage in cans may amount to about 4 pounds for every 1,000 pounds of milk delivered to the plant. Milk stickage in a bulk tank and hose connections will probably be only about 1 pound out of 1,000 pounds of milk collected. Therefore, the milk stickage losses should be less, but it is not likely to be a great saving.

Will butterfat tests be higher with a bulk tank?

No evidence has been found in research work done on this subject to support the claims often made for an increase in butterfat test when switching from can to bulk milk handling. The milk stickage in the cans will test higher than the rest of the milk, but the amount of milk stickage is so small that it becomes insignificant.

How would it affect the bacteria count?

It seems that with a bulk milk tank it should be easier for the farmer to produce high quality milk, but the farmer must wash and sanitize the tank very thoroughly each day. The bacteria count is likely to be lower because the milk is cooled more rapidly and kept at a lower temperature than in a can cooler. Most farmers who were producing high quality milk with the can system report very little change. Regardless of how the milk is handled there is no substitute for cleanliness.

What is the basic difference between the ice-bank and the direct-expansion type tank?

The ice-bank tank stores refrigeration in the form of ice. This ice is later used to produce chilled water which is circulated by a water pump through the cooling section around the outside of the tank liner to aid in the rapid cooling of the milk.

Direct-expansion or cold wall units have the refrigerant, freon, flowing through evaporating coils or plates which are in direct contact with the milk tank liner. This refrigerant, as it passes through the coils or plates, carries the heat from the milk in a manner similar to that in which a household refrigerator removes heat from its storage compartment.

What about the cost of cooling milk?

Bulk milk coolers in general will use less electricity than can coolers. The direct expansion bulk tank is more efficient than the ice-bank type when operated under similar conditions. Tests conducted at the University of Wisconsin indicate that direct-expansion tanks are likely to use from .2 to .4 KWHr less for cooling 100 pounds of milk than the ice-bank tanks. If electricity costs the farmer 2½c per KWHr, then this saving would amount to from ½ to 1c per 100 pounds of milk cooled.

Is a water-cooled compressor practical?

The cooling costs of tanks with air-cooled condensers will increase when the milkhouse temperature rises. Therefore, it is important to have good ventilation in the milkhouse and is practical to have a ventilating fan rather than depend on the windows for ventilation. For larger bulk tanks, especially direct expansion types, it is economical to have a water-cooled condenser as the saving in operating costs will pay for the additional investment. In warm weather, operating a water-cooled condenser may reduce the cooling costs as much as 35 to 40% in comparison with an air-cooled type. The amount of water needed to cool the condenser will vary from one to three gallons for each gallon of milk cooled.

Will it be necessary to rewire the milkhouse?

The present wiring will usually not be adequate when installing a direct expansion type tank but may be sufficient for an ice-bank tank. The greatest demand on the line is from the compressor motor which is about twice as large for a given tank capacity on a direct expansion unit as compared to an ice-bank unit. The size of compressor motor on direct expansion tanks is 1 hp per 100 gallons of daily capacity and on ice-bank tanks is between ⅜ and ½ hp per 100 gallons of daily capacity. Both types of coolers have a fractional horsepower motor on the agitator. The ice-bank type needs an additional ¼ or ⅓ hp motor for operating the water circulating pump. A 230-volt outlet must be provided near the port opening for connecting the pump motor on the tank transport.

Are fiber glass tanks practical?

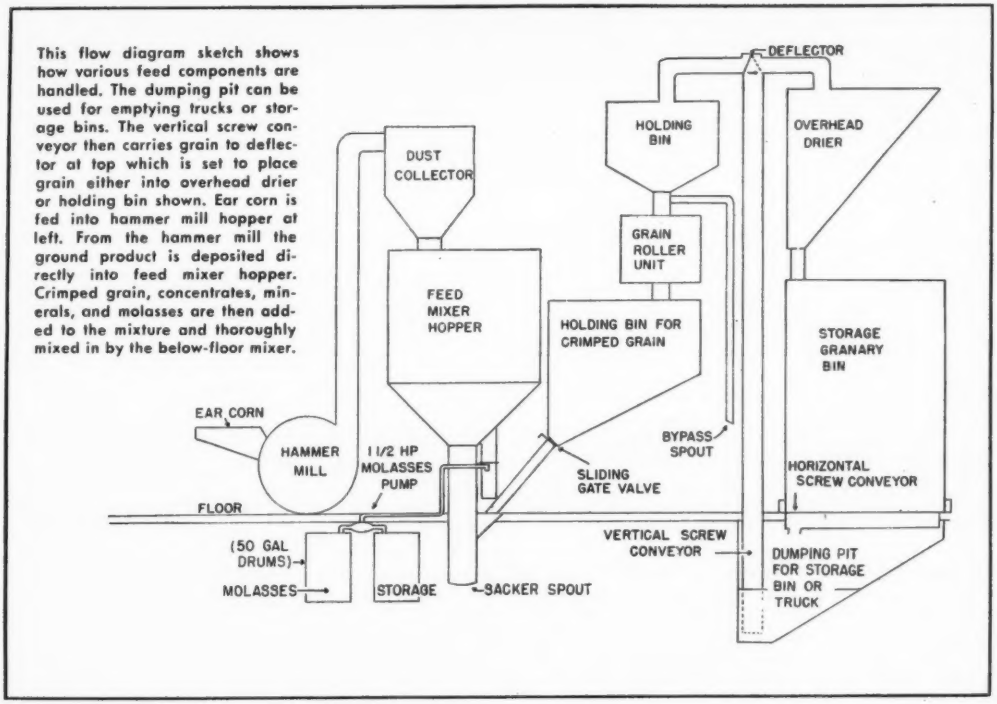
It appears that fiber glass should be very satisfactory for the outside wall of a bulk tank. The material should stand up well under the wet and damp conditions in a milkhouse and is resistant to chipping. It is as easy to keep clean as other materials used for outside tank walls.

What effect will a bulk tank have on milkhouse heating?

An ice-bank cooler will supply heat into the milkhouse similar to a can cooler. The length of time the compressor will be operating depends upon the amount of milk being cooled, but will likely be from 15 to 20 hours per day. In a well insulated milkhouse the heat removed from the milk will supply a considerable part of the heat needed to maintain the milkhouse temperature above freezing.

A direct expansion cooler will deliver the same total amount of heat, but in a shorter period of time. It will likely operate between 4 and 6 hours per day which will not produce as even a milkhouse temperature as the ice-bank types and may require more supplemental heat. However, the temperature will be warmer at the time of washing the milking equipment.

In general, bulk milk handling is one more step in the mechanization of dairy farming. Along with other devices, such as pipeline milkers, barn cleaners, silo unloaders, and mechanized feed handling, the farmer *can* produce more efficiently and with less drudgery. All of these things have been profitable to those who take full advantage of them through careful and smart management practices.


This flow diagram sketch shows how various feed components are handled. The dumping pit can be used for emptying trucks or storage bins. The vertical screw conveyor then carries grain to deflector at top which is set to place grain either into overhead drier or holding bin shown. Ear corn is fed into hammer mill hopper at left. From the hammer mill the ground product is deposited directly into feed mixer hopper. Crimped grain, concentrates, minerals, and molasses are then added to the mixture and thoroughly mixed in by the below-floor mixer.
DEFLECTOR
HOLDING BIN
OVERHEAD DRIER
DUST COLLECTOR
GRAIN ROLLER UNIT
FEED MIXER HOPPER
HOLDING BIN FOR CRIMPED GRAIN
STORAGE GRANARY BIN
EAR CORN
HAMMER MILL
1 1/2 HP MOLASSES PUMP
BYPASS SPOUT
SLIDING GATE VALVE
HORIZONTAL SCREW CONVEYOR
FLOOR
(50 GAL DRUMS)
MOLASSES
STORAGE
SACKER SPOUT
VERTICAL SCREW CONVEYOR
DUMPING PIT FOR STORAGE BIN OR TRUCK

Push-Button Feed Processing

Plan Ahead to Provide Complete Materials Flow Without Manual Labor

By **J. E. SAVILLE***

George Marlow, owner of Federal Hill Farm, Charles Town, West Virginia and Les Widmyer, manager-operator, have installed a push button feed grinding and mixing setup which eliminates practically all the manual labor involved in this chore. The setup was not an overnight or short time project. An overall design plan was worked out ahead of time. Then it was developed by stages over a period of two years to fit into the original long-range plan. Practically all the work such as wiring, installing equipment, and granary alterations was done by Widmyer who is a qualified electrician.

Conveyors and Gravity Do All the Moving

The system is so arranged that the harvested grain can be taken by a vertical auger conveyor to an overhead drier. After the grain is dried it is stored in the granary below the drier. The dried grain is moved from the granary by means of a horizontal auger, which feeds back to the vertical auger, from here it is elevated to a holding bin. The grain is then fed by gravity from the holding bin to a grain roller. After the grain is crimped it drops into another holding bin where it is stored until mixing. The crimped feed drops by gravity from the latter holding bin to the mixer. Concentrates and minerals are added at the mixer which is a below-floor type machine. The system is so arranged that the holding bin can be filled with grain and the crimper can be left unattended while the grain is being crimped.

Widmyer has an unusual and very satisfactory method of adding molasses to the feed. The

*Mr. Saville is Extension County Agent, Charles Town, West Virginia.

molasses is stored under the barn floor in two 50 gallon drums. A gear pump with a 1½ hp motor is installed between the two drums. This pump is capable of shifting molasses from one barrel to another or by-passing one barrel and going directly to the feed mixer. The molasses is heated to 90° F. by means of a lead-covered soil heating cable that is immersed below the level of the liquid in the drum. The temperature is controlled by a thermostat. Heating cable is adapted to heating molasses without danger of caramelization. The pipes from the pump to the mixer are wrapped with heating tape, controlled by a thermostat, to prevent heat losses during the transfer to mixer.

Molasses Sprayed Onto Feed

The molasses is added to the feed with a garden hose nozzle that is enclosed in a 10-inch furnace flue pipe. The pipe is connected to the sacker on the mixer. As the feed flows through the pipe, the molasses is sprayed on the feed at a temperature of 90°F. and at 80 pounds of pressure. The amount added is determined by the consistency of the feed. The use of a coarse feed and the addition of heated molasses under pressure keeps the mixer from becoming clogged or gummed. Widmyer reports that the electrical costs in grinding and mixing one ton of feed is about 20 cents.

It is pointed out by Widmyer that in order to use this equipment a safe, adequate, economical and flexible wiring system is necessary. He has a 100 ampere, 230-volt service at the barn. The farm has a distribution pole with a 200 ampere, 230-volt service.

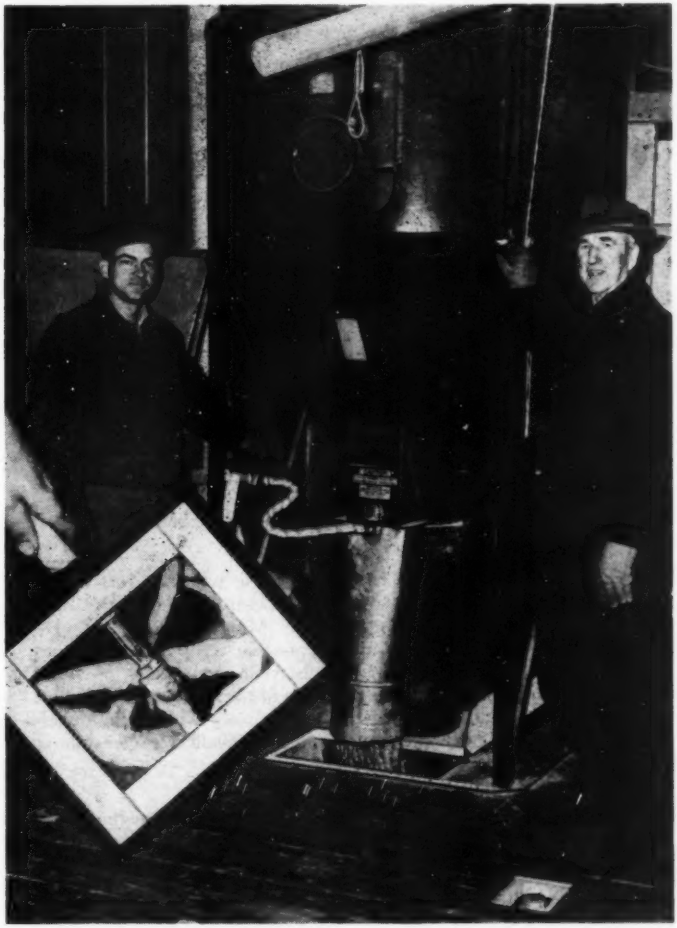
Widmyer reports that labor is saved in the following ways:

- No lifting of grain at anytime.
- No time or labor required to haul grain to local mill.
- Mechanical mixing.

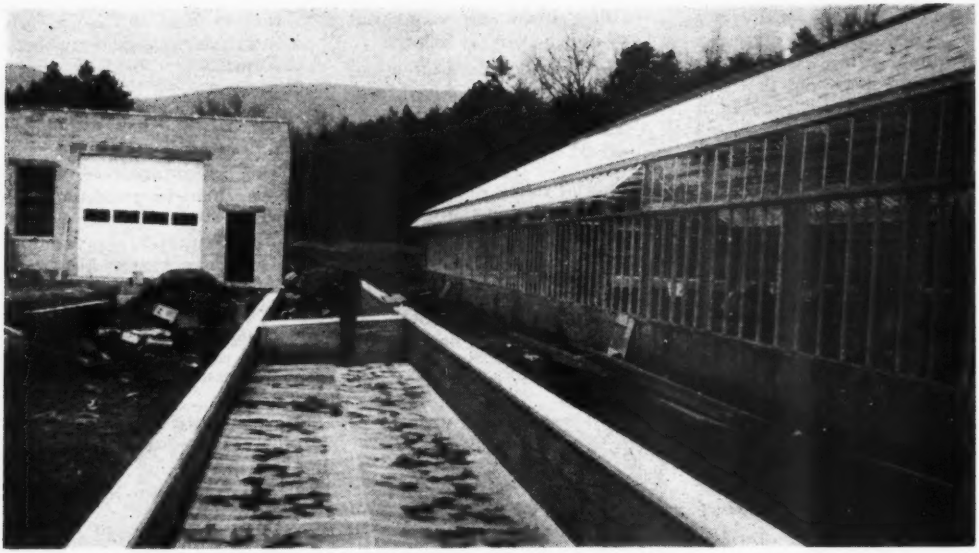
Other advantages pointed out by the owner are as follows:

- Feed can be mixed often and cattle like freshly mixed feed.
- Small batches of feed can be mixed for calves.
- Special ration operations can be handled on rainy days or nights.
- No preparation is necessary before starting operation, as all equipment is ready to run at the touch of a button.
- It does away with the temptation to feed the calves any ration that happens to be on hand.
- Man hours are saved, about one and one half man hours for each ton of feed mixed.

This system makes it possible for one man to go ahead with the feed preparation work. Last winter, Widmyer was without the service of his two hired men for some time. He states it would have been impossible to have made it alone without the service of the feed processing equipment. □ □



Flow of all the material through the mixer can be controlled from this point. In actual operation, the cycle is started manually and mercury limit switches stop it automatically. The close-up (inset) shows how a 10-inch furnace pipe is used to house the molasses nozzle. It is connected to sacker opening of the mixer.



Smith's electrically heated plant bed is constructed of concrete blocks stuccoed on the outside to insure tightness. The 6 ft. by 120 ft. (outside dimensions) bed has twelve 800-watt soil heating cable units. The heating cable is covered with 1" of sand over which hardware cloth is placed to protect cable from tillage implements. Wattage per square foot of bed area requirements differ with geographical locations and should be varied to suit local conditions.

Heated Plant Bed Starts Tomato Seedlings

Hot Bed with Soil Heating Cable Protects "Real Early" Tomato Plants from January Weather.

By **JOHN T. CUTCHIN**

The vegetable farmer, or "Truck Farmer" as he is so often called, has been starting such plants as tomatoes, peppers and eggplant in hotbeds for years to receive premium prices on the early vegetable market. During recent years, a number of these farmers have turned from manure beds to beds heated electrically because the controlled heat produces a better plant. David A. Smith of Greenwood, Virginia, has found that the electrically heated plant bed has still another use. He uses it to grow a "real early" tomato plant for greenhouse production.

Recently, Smith constructed a greenhouse which covers a half acre of bottom land in the Blue Ridge Mountain foothills. He raises two crops of tomatoes each year consisting of 4000 plants of the Ohio Wilt Resistant Globe variety which was developed specifically for greenhouse conditions.

Uses Controlled Conditions

These tomatoes are grown under ideal and controlled conditions. A modern heating plant keeps temperatures uniform day and night, while an overhead irrigation system supplies the desired amount of moisture to the plants. To further insure good yields each plant is vibrated daily causing pollen to mix among the blossoms.

Smith learned that farmers engaged in raising tomatoes under glass in other areas were using various methods to start their plants. Some sowed their seeds in rows in a seed flat, transplanted the seedlings two inches apart in another seed flat, and then transplanted individual plants into 4" pots. Other growers transplanted from the original seed flat to the 4" pots, while still others planted seed directly in the 4" pots. In every case, the plants were left in the

4" pots until they had developed to desired sizes for transplanting into the greenhouse.

These methods of starting plants were considered by Smith but he found that each would necessitate an additional greenhouse and would require additional time and labor for handling and caring for the plants. With planting time for his second crop falling in February, raising the required number of plants suitable for transplanting in the greenhouse posed a real problem.

Soil Heating Cable Solves Problem

The problem of plant raising was readily solved however, when Smith learned of soil heating cable and how efficient and economical its use would be for plant raising. He wished to eliminate as much plant handling as possible so decided to plant seeds 4" apart in the bed. All plants remain in the bed until they reach the desired size for transplanting into greenhouse.

To obtain the desired soil temperatures in the plant bed for optimum plant growth, twelve 800-watt, 230-volt electrical heating units were used. The desired temperatures of 70° F for the first week and 65°F until plants were transplanted into the greenhouse were maintained thermostatically.

"This Setup Gives Me a High Quality Plant"

The cost of the plant bed was $800. The cost for construction of a greenhouse to raise an equal number of plants in 4" pots would have been approximately $3000. Consequently, a saving of $2200 was made, plus the added saving in eliminating handling of the plants.

Smith says, "This electrically heated plant bed of mine is a real time, labor, and money saver. It gives my plants ideal conditions in which to grow and gives me a high quality plant for my greenhouse." □ □

Do you want to brag about your water system? and be paid for doing it—

Seriously, we would like to know what water under pressure means to you on your farm. Has it increased production or provided a better quality farm product? Does it save you labor? It has certainly meant better living for you and your family.

Please tell us informally, in a letter of between 200 and 400 words, about your water system. We will award prizes as listed here for the six top entries as determined by our judges. And you'll note a set of questions below which we would also like to have you answer. These may not necessarily be bragging but the answers to these questions will have no bearing on the judging of your entry letter.

RULES

1. Entry letters, accompanied by the coupon below, must be postmarked before February 15, 1957.

2. The winners, as selected by our judges, will be announced in the May issue of ELECTRICITY ON THE FARM.

3. Prizes will be awarded as follows:

1st prize	**$50.00**
2nd prize	**$25.00**
3rd prize	**$10.00**
three next prizes	**$ 5.00 ea.**

Regular rates will be paid for any other letters or portions thereof printed in the magazine.

4. The decision of the judges is final and all entries become the property of ELECTRICITY ON THE FARM Magazine, 305 E. 45th St., New York 17, N.Y.

OFFICIAL ENTRY BLANK

(Be sure to return completed form with your entry letter)

MAIL TO: Farm Services Editor,
ELECTRICITY ON THE FARM Magazine
305 East 45th Street, New York 17, New York

Your Name.....

RFD #.....Town.....State.....

Name of your Power Supplier.....

We would appreciate your frank answers to the following questions:

1. Is your present water supply (well or other source) adequate?
   Yes..... No.....
2. Does your present water supply require treatment before use?
   Yes..... No.....
   What kind of treatment?.....
3. Do you have water under pressure for your livestock or poultry?
   Yes..... No.....
4. Do you have plastic pipe in any part of your system?
   Yes..... No.....
5. Tell us briefly what troubles you have had with your water system, if any.

.....

.....

.....

6. Has your dealer been helpful in correcting these troubles for you in the past?
   Yes..... No..... What did he do?

.....

.....

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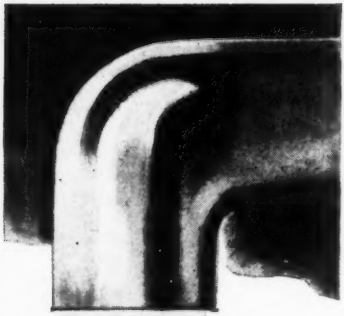

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Can You See What You Are Doing?

• Around Your Home • Down in the Barnyard • Out in Your Machinery Service and Repair Areas

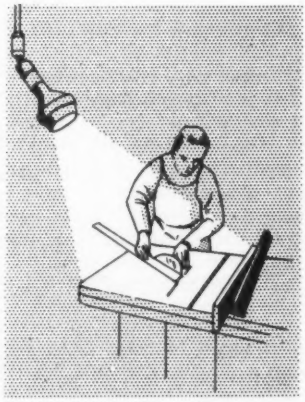
By **J. P. DITCHMAN** and **J. L. TUGMAN**

The term "social security" is a common expression in our daily conversation. It comes about naturally as our everyday activities are enhanced and benefitted by modern machinery and automatic processes. But with all this machinery comes an increasing problem of safety. Accidents take such a large toll of our time and resources that we must take systematic action to keep them under control. On the farm, this is a sphere of "social security" that each family must take care of themselves. Insurance may help to meet expenses resulting from an accident, but careful safety precautions can spare us a lot of needless pain and grief.

Night Lights For Home Safety

Failure or inability to see some obvious hazard accounts for many of the accidents in the home and around the farm. The broken toe suffered by a sleepy farmer because he didn't see the chair he banged with his foot; or the fall on the stairs that occurred because a child's toy made him lose his balance; or the medicine taken by mistake for lack of a little light—are all commonplace types of accidents which could be made less possible with the aid of a lamp, and a switch he remembered to turn on. The home has a much larger percentage of accidents than we suspect. We think of home as the safest place we can be. With a little care it could be much safer, but we neglect doing the things that safety requires until an accident occurs to spur us into action.

Simple night light units in a baseboard outlet can prevent a large number of common home accidents. Two or three of these make a large difference in sleeping rooms and hallways. Their



Every major shop tool with moving parts such as the table saw, grinder, lathe, and sander should be spotlighted at the work area to provide adequate seeing capacity for the operator.

light will show up hazards when walking around in dark rooms. At the same time, this illumination will not disturb sleepers nor is it bright enough to appear glaring to one aroused from rest.

Night lights are a great comforter to children who may be afraid to go to bed in the dark. Their gentle glow is a reassurance to old folks, too, who may be afraid of falling if they get up in a dark house. A night light in the bathroom can minimize the hazard of taking the wrong

A little 7½-watt light left on during the night in a bedroom or bath provides enough lighting to see and avoid any hazards such as a misplaced chair or a toy left on the floor.

pill. Thus, for a very small expenditure, a large safety feature may be available to all members of a household.

Spot Light Power Tool Work Areas

Power tools reduce labor and save time but they may cause accidents too if we try to use them in the dark. Buzz and band saws, lathes, grinders, drills and sanders are all commonplace pieces of equipment in today's farm workshops. Each of these units should have specialized lighting to assist the operator in seeing his task properly. Supplementary lighting supplied by PAR lamps (multipurpose lamps with built in reflectors) will provide the seeing capacity needed to operate these tools safely and efficiently.

The grinder needs special attention since the operator must wear goggles when using this machine. The purpose of the goggles, of course, is for eye protection against chips and sparks. But the goggles subtract part of the general lighting from the eye so more supplementary lighting must be provided at the grinder work area.

Use Lights in Storage Rooms

Storage rooms are another area where just a little bit of light makes for a great deal of safety. Fuel storage rooms housing gasoline, kerosene, oil and grease should have a light with a proper electrical fixture. This storage area is often plagued with explosive fumes and using a match as a light source may cause an explosion or fire.

Tool storage rooms should have enough light to enable easy

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Portable lights should use rough service lamps or provide physical protection for the lamp if flood types are used as shown here. The fixture should also be self-supporting so as to direct light as desired without further attention.

identification of various tools. Unless it is easy to see the axe or the pitchfork, locating them may be a painful experience. Tool room lighting is indeed a measure of housekeeping that will pay regular dividends in greater safety as well as more convenience and better efficiency.

There is need for consideration of lighting that will protect livestock also. The farmer needs enough light to see each animal in the herd for both his safety and that of the animal. At feeding time he must have ample light to detect foreign bodies in the hay or feed. A piece of baling wire fed to an animal may cause serious injury.

In summary, a safe rule for safety in all farm chores is to be able to see what you are doing. Anything less invites trouble. You can't afford to jeopardize your everyday "social security" by lack of enough light to see the hazard involved. □ □

Manufacturer Announces New Motor

A new single phase, all purpose motor known as the repulsion capacitor motor is now being manufactured in 5, 7½ and 10 hp sizes according to a report by the manufacturer. The new motor, designed especially for difficult starting farm applications such as barn cleaners and silo unloaders, provides a very high starting torque while at the same time requiring a relatively low starting current. This high efficiency feature is very desirable since it aids in preventing low voltage conditions due to overloaded power lines and electric circuits. The motor also incorporates a design characteristic which insures its maintaining full rated 1750 rpm speed under full load. This means greater efficiency when used on such applications as a crop drier.

Announcement of the new motor was made at the American Institute of Electrical Engineers' Farm Electrification Conference held at Memphis, Tenn. recently. The motor is manufactured by the Brown-Brockmeyer Co. of Dayton, Ohio.

Many a disillusioned husband finds out that the gal he married because she fit so perfectly in his arms doesn't begin to fit his pocketbook. . . . QUESTION and ANSWER DEPT.: NO, Gracie, a FJORD is NOT a NORWEGIAN AUTOMOBILE. . . . The LITTLE-BOY-NEXT-DOOR, all enthused about his history lesson, asked his father, "Daddy, in the OLD days did the knights fight with BATTLE AXES?" "Well, son," replied his father, "the MARRIED ones did." . . . SODDEN THOUGHT: MIDDLE AGE SPREAD is THE DESTINY THAT ENDS OUR SHAPES. . . . DUDE RANCH: a place where a fellow who is RICH enough to drive a Cadillac rides a HORSE. . . . LET'S FACE IT—it's EVERY gal's dream to be swept off her feet by a fellow she can boss. (Caw! Caw!) . . . EXAM PAPER GEM: "A DEACON is a guiding light to warn the people." . . . Vesta Kelly in Quote sez "COURTSHIP is a period of time that OFTEN starts with a WHISTLE and ends when the groom RINGS the BELLE." . . . EVERSTOPTOTHINK?—DELERIUM TREMENS can best be described as a TIGHT FIT. . . . WIT'S END DEPT.: A LOT of MOLEHILLS become MOUNTAINS just because someone adds a little DIRT. . . . Then there's the story of the KANGAROO who consulted a psychiatrist, complained as he reclined on the couch, "I can't imagine WHAT'S the matter with me. I just DON'T feel JUMPY." . . . Watching a super-dooper giveaway program on TV recently we were startled when the EMCEE asked a henpecked-looking little man WHAT he did before he was married and heard the little man exclaim, "ANYTHING I wanted to." . . . OVERHEARD two stenos at lunch in the beanery booth next to me. Said one to the other, "I just love to have CASH in my checking account—it's LIKE MONEY in the BANK!" . . . PARTING THOUGHT: A MOVIE PRODUCER is a fellow who THANKS HIS LUCKY STARS. . . .

Your pun-peddler—DUFFY

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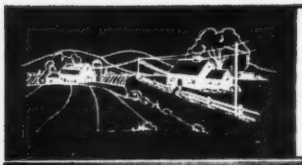


Electricity in

THE FARM HOME

EDITED By ELINOR CASAVECCHIA

Exceptionally good lighting conditions were found in the living room of the John Shultz farm home in Kokomo, Indiana. The lighting consists of 5 properly designed reading lamps, 2 general overhead lights and decorative cornice lighting.

Let's Look At Lighting

Consider Adequate Light As The Primary Function and Decorative Effect Secondary When Choosing Lamps, Shades and Fixtures

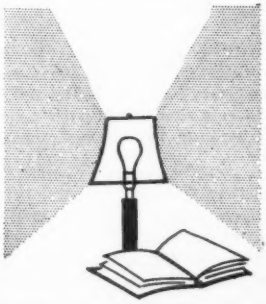
If you were shopping for a lamp what features would you look for? Naturally, you'd want an attractive lamp, one that would blend in nicely with your home decorations. But—don't stop there!

A lamp's main function is to provide light for a particular purpose. So, when shopping for a lamp remember what it's function is to be. Will it be used for reading or other tasks requiring the close attention of the eyes? Will it be used for the work areas of the kitchen, laundry or workshop? Will it be used for lighting your face for make-up or shaving? Or will it be used to provide general or decorative lighting?

Light For Reading

When selecting a lamp for reading, sewing or other close work, the color, size and position of the lamp shade, the height of the lamp and the wattage of the bulb must all be considered.

Lamp shades are important for see-ability as well as for decorative purposes. Remember that dark colors absorb light. If you need a colored shade for an accent in your room, choose an opaque shade (one that lets no light through), but be sure that the inner surface of the shade is white. If the shade you choose is translucent (one that lets the light through), it should be white, or as neutral a color as possible. A colored, translucent shade would distort the color of



Right: A bulb that is located low in the shade will allow a wide spread of light.

the light and its effect upon your furnishings and complexion.

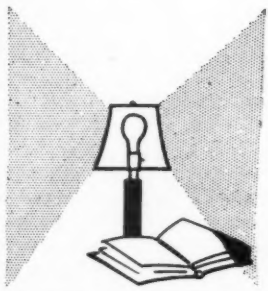
Two other rules to remember about the lamp shade are that the bulb should be located low in the shade (see illustration), and that the lower diameter of the shade should be large enough to allow a wide spread of light.

One of the biggest mistakes made in choosing table lamps is in selecting the correct height. It may be a cute little lamp—but can you see by it? The average height of a table lamp should be between 14 and 18 inches from the top of the table to the lower edge of the shade. The accompanying chart gives recommended dimensions and bulb sizes for various types of lamps.

Lighting the Work Area

Adequate lighting in the kitchen, laundry, workshop and other "work areas" in the home is most important. A single ceiling fixture in the middle of the room is not adequate for these areas since, no matter how strong a light it is, you would always be working in your own shadow.

Spotlights or fluorescent lamps directly over each work area provide a pleasant and adequate light for your daily tasks. Fluorescent lamps need not be harsh for they are available in a number of different shades ranging from cool white to the warmer tones.



Wrong: The spread of light is narrowed when the bulb is too high in the shade.

Light for Make-up and Shaving

If you have to tilt lamp shades, stoop over, or take a hand mirror to the window, your vanity lighting is obviously not adequate. To provide the right amount and kind of light for applying make-up, you need a pair of lamps, one on either side of the mirror. The lamps should be tall enough so that the bulb on each lamp is on a line with your face. Shades should always be translucent and white to give a clear, undistorted light.

Don't overlook the possibilities of 3-way bulbs for vanity lighting. The bulb can be turned to the highest wattage for make-up or down to a lower wattage for general lighting.

Since beards aren't in season, the men of the house need a good light for shaving. Fluorescent lighting fixtures are most frequently used for lighting the bathroom mirror. A tube on each side of the mirror about 30" apart is recommended. A third tube at the top of the mirror adds greatly to shaving comfort. The 20-watt (24 inch) lamp is the minimum size to consider for this application.

Carefully chosen decorative lighting can add greatly to the beauty of a room. Subtly used valance lighting, portrait spotlighting, shelf lighting or ceiling fixtures will add warmth to a room and help to emphasize the mood you are trying to create.

Incandescent bulbs are now available in a variety of color tints. These tinted bulbs do not change the color of light to any great degree, but they will bring room colors out more sharply. For instance, if blue tinted bulbs are used in a predominantly blue room all of the blue tones will be clearer, whereas a white bulb would tend to make the color fade-out a bit. Tinted bulbs may be safely used for reading lamps.

Light is yours to paint with, to achieve visual comfort and beauty of surroundings. By learning a few simple rules of good lighting and by applying a little common sense, you should have no trouble in selecting beautiful and adequate lighting fixtures for your home. And, because the cost of lighting is so small, be sure that there are enough fixtures in your home for every visual activity. □□

Lamp Specification Chart

	HEIGHT FROM BOTTOM OF BASE TO BASE OF		MINIMUM DIMENSIONS OF SHADE			
TYPE LAMP	SOCKET	SHADE	BOTTOM DIA.	TOP DIA.	HEIGHT	WATTAGE
DRESSING TABLE	10"	11 1/2"	9 1/2"	7"	7"	30-70-100
DRESSER	16 1/2"	18"	9 1/2"	7"	7"	30-70-100
WALL-BASED	--	2"	13"	8 1/2"	8"	50-100-150
WALL-BASED	--	11 1/2"	10"	6"	6 1/2"	100
STANDARD TABLE	14"	15"	16"	8 1/2"	10"	50-100-150
STANDARD TABLE	17"	17"	16"	8 1/2"	10"	50-100-150
LARGE TABLE	17"	18"	16"	14 1/2"	13 1/2"	100-200-300
BRIDGE	46"	48"	13"	8 1/2"	8"	50-100-150
SWING-ARM	45 1/2"	47"	16"	10"	9"	50-100-150
JUNIOR FLOOR	45 1/2"	47"	16"	10"	9"	50-100-150
SENIOR FLOOR	48"	49"	18 1/2"	10 1/2"	10"	100-200-300

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- *Is Versatile and Easy To Use*
- *Is My Best All-Round Helper*

By **LOIS HALES**

Mrs. Cuthbert has found many uses for her vacuum cleaner in the kitchen. The vacuum's attachments make it easy to pick up crumbs and dust from such hard-to-get-at places as the range storage drawer, under the refrigerator, kitchen drawer corners and cupboard shelves.

My vacuum cleaner is my best 'all-around helper' in housecleaning," said Mrs. Blair Cuthbert, who lives on a farm near Rigby, Idaho, where some of those famous Idaho potatoes are grown. Through her years of being a farmer's wife, she has learned to conserve her energy by taking the "short cuts" afforded by electrical appliances in doing her daily work. One of the best assistants in her predominantly male household is her electric vacuum cleaner. She finds that complete removal of dust, dirt and sand from floor to ceiling is not only possible, but simplified, through the use of this handy appliance.

Mrs. Cuthbert likes the ease with which the crevice attachment of her cleaner serves her in those difficult-to-clean places between and behind base cabinets and larger kitchen equipment. Kitchen drawer corners and dresser drawers are easily whisked clean of crumbs and hard-to-pick-up particles with this tool. She also uses it to remove dust from her suitcase interior and to clean powder specks from her handbag.

Since her children were both boys and needed for farm work, the full brunt of the care of the home has been her responsibility. And now when her four granchildren come to visit, the living room gets considerable lived-in use. The grandchildren love to run through the house and yard and up into the tree house that Grandfather Cuthbert helped them build.

Carpet Protection

The dirt and dust tracked over floors and rugs is easily swept clean in a few moments' time with her vacuum cleaner. Mrs. Cuthbert says that frequent removal of soil from rugs prevents it from sifting down into the carpet where the tiny gritty particles can cut the backing and pile. In using her cleaner often, she is not only keeping her home clean, she is preserving the beauty and wearing quality of her carpets.

She finds the dusting tool is handy to use for removing dust

from her books, bookcase, lamp shades and knickknacks, particularly those surrounded by plants on her living room window sill.

Mattresses are easily cleaned and freshened with the upholstery nozzle. Using a fairly long wand, Olive Cuthbert stands to one side of the bed where she has freedom of movement and conveniently removes dust and soil from the top side of the mattress. Then the mattress is turned over and the other side is cleaned. She also cleans her fur and woolen clothing with the upholstery nozzle.

Moth-Proofing With The Vac

Mrs. Cuthbert especially likes the effortlessness with which she can de-moth her winter clothing for summer storage. With her vacuum cleaner blower attachment, air blown through moth crystals and into her garment bag takes care of this task for her. She also uses this same garment bag for storing her summer clothing in winter. By using the blower attachment, she is able to freshen her clothes without bothering to hang them out on a clothesline. And when they have colds, the vacuum cleaner blower becomes a vaporizer in the Cuthbert home.

Floor To Ceiling Cleaning

The floor brush doubles for use as a wall and ceiling cleaner and again the long wand assists her reach so that it is not necessary to climb on chairs and furniture. And, using the proper cleaner attachment, her multi-pleated draperies quickly become dust-free. Chairs and sofa, too, get attention from the cleaner.

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9183—Our new Printed Pattern—makes sewing this princess dress and jacket a cinch! Misses' Sizes 10-20. Size 16 dress, 4⅛ yards 35-inch; bolero 1¾ yards.

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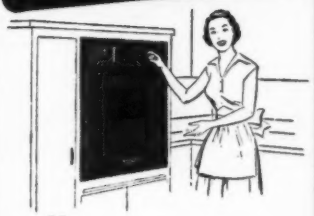

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with a Diamond Iron Removal Filter
Leaves water clear, sparkling-palatable. Write:
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Sewing Contest Winner

Once again a 4-H, F.H.A. girl has been picked as a winner in a national sewing contest sponsored annually by the Singer Sewing Machine Company.

Our talented Miss is 17-year-old Marlona Ruggles of Lexington, Kentucky. Marlona placed third in this national contest with a beautifully made brown and white wool tweed, sheath dress.

The contest began last spring and continued through the summer. Nearly 60,000 girls, between the ages of 10 and 17, entered by taking lessons at their local sewing centers. The garments they made there were entered in the contest.

First eliminations took place at the local level where the winners each received a fitted scissors set. The prize-winning garments were then judged on a regional level. Last year Marlona placed second on the regional level, but this year she came out on top and, along with the other winners, received a Slant-Needle Portable Sewing Machine with an Automatic Zigzagger, and a $300 bonus scholarship. A panel of judges then selected the four best senior entries (14-17 years) and the four best junior entries (10-13 years) from the 66 regional winners.

Marlona and her mother, Mrs. John Foster Ruggles, along with the other winners and their mothers enjoyed an all-expense trip and stay in New York City, where the final judging took place recently. As third place winner, Marlona received a check for $600.

Marlona says that she has been sewing for seven years. Besides sewing for herself, she makes many of her Christmas gifts. She is in the 12th grade at Lafayette Senior High School where she is a member of the F.H.A., College Club, and a girls choral group. She is an active member of the 4-H, Senior Girl Scouts, Christian Youth Fellowship and the Ground Observer Corps. As a special project, Marlona won a blue ribbon at the 4-H County Fair for her sewing abilities, and red and blue ribbons at the State Fair. She is also a County Champion of Rural Arts and Recreation projects. Her hobbies, besides sewing, include camping, music, swimming and square dancing. After high school, Marlona plans to attend the University of Kentucky and major in Home Economics.

Congratulations to you Marlona, and to all of you 4-H and F.H.A. girls who are doing such a wonderful job in acquiring homemaking and dressmaking skills throughout the country. □ □

Marlona Ruggles models the dress that won her third place and many prizes in a national dressmaking contest.

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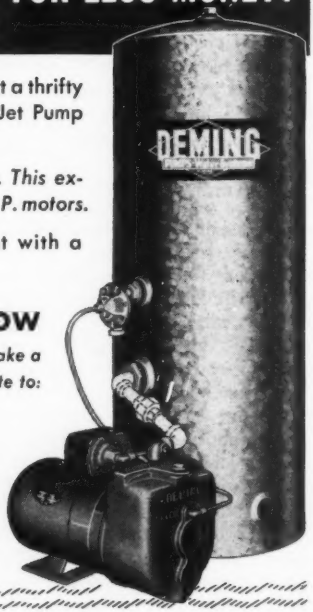

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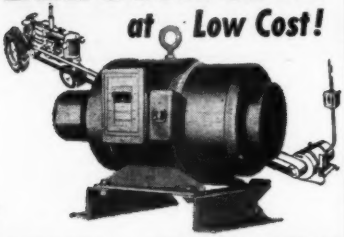

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This is The Way We Wash Our Clothes

If you are in doubt about laundering an article, read the washing instructions on the tag. In most cases, they will be as correct and helpful as possible. Here's a good homemaker hint: save your how-to-wash tags and describe the garment on each one for quick identification. Then keep all tags near your washing equipment for ready reference.

If you're a heating pad fan, don't ignore the cover. The newest terry cloth covers zip off in a flash for a sanitary washing in hot soapsuds. If you're handy with needle and thread, you can make extra covers out of old bath towels! In fact, you could make several in different colors—and assign a certain color to each member of the family.

Keep fragile curtains dainty by washing them often in lukewarm soapsuds and rinses. If they're dryer-dried with temperature control set at "low," they'll come out soft, fresh, and fluffy. Ruffles will need no ironing unless you're extra fussy, but the panels may need a touch-up job with a cool iron.

Candlewick bedspreads will not be "detufted" if placed in a large sack or pillow slip when washed in a washing machine.

Less starch is needed if you use an ironer which exerts considerably more pressure than a hand iron. Use about one half the usual amount of starch after sudsing and rinsing the clothes.

Ironing will go faster if you fold newly-laundered clothes after sprinkling. Fewer wrinkles get set in damp fabrics when they are folded instead of rolled.

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4-H Electric Winners

Outstanding Knowledge and Achievements Win

Scholarships for National Champions

Forty-four rural boys and girls from across the nation were recently awarded expense-paid trips to the National 4-H Club Congress in Chicago for being selected as state winners in the annual Electric Program.

The Electric Program is sponsored by the Westinghouse Educational Foundation, which is supported by the Westinghouse Electric Corporation, and provides the expense-paid trip to the 4-H Club Congress for girls and boys who have excelled in electrical projects to improve their homes or farms. In addition, the Foundation also awards $300 scholarships to the six who are chosen as national winners.

The 1956 winners completed a wide variety of electrical projects designed to improve operations and conditions on their farms and in their homes. Many of the winners have been in 4-H work for as long as nine years and have won numerous blue ribbons for their acivities. Some of the prize-winning electrical projects included an automatic pea sheller, a radio broadcasting set, an air conditioner, a heated stock watering trough, emergency generating unit, and all kinds of wiring and lighting projects. One of the seven girls investigated the lighting conditions in her school and made suggestions for improvement to

The six top winners in the 4-H Electric Program receiving $300 scholarship awards at the 35th National 4-H Club Congress in Chicago from Dale McFeatters (center), vice president of Westinghouse Electric Corp. They are, left to right: JoAnn Raber, Whitewater, Colo.; Andrew Kasznay, Jr., Torrington, Conn.; Robert Harris, Bessemer, Ala.; Kenneth Krause, Kilbourne, Ill.; Don Jeans, Ponca City, Okla.; and Merwyn Eshelman, Centerville, Wash.

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CRIMPS - CRACKS *Without Dusting* **ALL FEED GRAINS**

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"ALL PURPOSE" Ear Corn MILLS Crumbles entire ear **without dusting.** Cracks or crimps all grains. Stationary and Portable models. A money-maker for every cattle feeder.

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Now you can quickly sharpen farm discs in a farmer's **own yard** or **shop.** New portable Foley Disc Sharpener jacks up harrow, rotates discs as it grinds them—takes only 1 or 2 minutes per blade. Saves farmers time and trouble—no dismantling or hauling to town—and you can make up to $25 a day. Foley equipment easily carried in car trunk.

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school officials. The state college heard of her project and has now taken over the study, expanding it to survey all of the rural school classrooms in the state.

The following is a brief resume of the work that won national awards for six of these young people.

Robert Harris, 17, of Bessemer, Alabama, has been active in 4-H Club work for six years. He has served both as vice president and president of his local 4-H Club and has held similar posts in the Jefferson County 4-H Club. Since beef cattle are the principal product of his father's 60-acre farm, the Alabama youth has demonstrated a special interest in this field. For the past two years he has won the Grand Championship for beef cattle in his county, and has participated in beef cattle showmanship and beef cattle judging demonstrations. Robert conducted these latter two demonstrations on the local, county and district levels. A versatile 4-H worker, he has made a variety of electrical equipment including extension cords, a radio, seven motors, ice cream freezer, feed mixer, bench saw, three table lamps and many other such items.

A senior in McAdory High School, he is a member of the basketball, football and baseball teams, and is also vice president of the Junior Session Room. He plans to attend Alabama Polytechnic Institute but hasn't decided whether to pursue a business or agricultural career.

JoAnn Raber, 17, of Whitewater, Colorado, has completed 25 electric projects in five years and has developed and presented six different electrical demonstrations 53 times to audiences totalling thousands. Included in her electrical work is a water-cooled air conditioner for the calf barn on her father's 1000-acre farm. She made the unit from a lard barrel, a ½ hp

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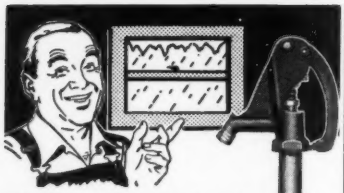

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motor, an 18-inch fan blade and an oil pump which she converted into a water pump. Among other electrical devices to her credit are: nine table lamps, an electric belt sander, an electric pencil, a four-way switch panel, and three sets of floodlights. She gained further experience in the electrical field by assisting in the wiring of three houses.

Among the honors JoAnn has received for her electrical achievements are: two county championships, a state reserve championship and two state championships. Active in 4-H work for six years altogether, JoAnn has held responsible offices in local, county and state organizations, has completed work in five other projects besides the Electric Program. She has gained about $500 in prizes and money earned. Upon graduation from Grand Junction High School, where she now is a member of the senior class, JoAnn plans to attend Colorado A. & M.

Andrew J. Kasznay, Jr., 17, of Torrington, Connecticut, already has gone a long way toward his goal of becoming an electrical engineer. His impressive list of accomplishments during five years participation in the Electrical Program range from making lamps, doorbells and extension cords to serving 100 hours as an electrical apprentice. In working with his father, who is an electrician and an appliance dealer, Andrew learned how to change pressure switches on water pumps, repair automatic washers, wire houses and go on service calls.

His ability and knowledge of electrical equipment have won him six blue ribbon awards at county and state fair demonstrations. He has also been awarded a 4-H certificate of junior leadership for forming an electrical club of 10 boys. Andrew says his most interesting job was a bright-and-dim control board for Christmas lights that he made and operated for a church play.

In nine years of 4-H club work, Andrew has completed a wide variety of projects. Before his family moved away from their farm, he raised beef and pigs, was in the cooking club and played a "washtub" bass in the 4-H hillbilly band which he helped to organize. He is an accomplished square dancer.

A 12th grade student at Monson Academy in Monson, Mass., Andrew has been president, vice president, secretary, treasurer, and reporter for his local club. Among his other activities, he is manager of his school's football team, and is a member of the Boy Scouts, Grange and DeMolay.

Kenneth E. Krause, 18 years old, of Kilbourne, Illinois, has been a member of the 4-H club for eight years—four of which he has been in the Electric Program. He has made an electric water pump, automatic water fountains, an electrical test panel, an outdoor Christmas display, ventilating fan, yard light, grain auger, grain bin drying ducts, heat lamps and an electric lawn mower. In the past four years he has won seven "A" awards in the county and state fairs with his exhibits.

Ken has been a junior leader for three years and has given more than ten demonstrations on various phases of electricity. In his local club, he has been president, vice president, secretary and reporter. He has also

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4-H Electric Program Winners

State	Name of Winner	Address
*Alabama	Robert Harris	Bessemer
Arizona	John. T. McGrath, Jr.	Florence
Arkansas	Roy E. Baker, Jr.	Blytheville
California	Allen L. Hove	Goleta
*Colorado	JoAnn Raber	Whitewater
*Connecticut	Andrew J. Kasznay, Jr.	Torrington
Florida	Marilyn Cox	Starke
Georgia	Patricia Prouty	Savannah
Idaho	Lynn Hossner	Ashton
*Illinois	Kenneth Krause	Kilbourne
Indiana	James A. Becker	Crown Point
Iowa	Gerald F. Johnson	New Hampton
Kansas	Richard Schuster	Superior, Nebraska
Kentucky	Parker Ray Blevins	Monticello
Louisiana	Robert J. Alario	Golden Meadow
Maine	Gerald Bowie	Yarmouth
Maryland	Charles Lee Black	New Windsor
Massachusetts	Charles Cafarelli	Hopkinton
Michigan	William Kissane	St. Johns
Minnesota	Wesley Sunvold	Sacred Heart
Mississippi	Charles Bray	Thaxton
Missouri	Ronald S. Dingus	Appleton City
Montana	Jerry Ryan	Deer Lodge
Nebraska	Perry Dawes	O'Neil
Nevada	Bernard Haynes	Minden
New Hampshire	Bert John Allen	Epping
New Mexico	Stanley Rogers	Artesia
New York	Theodore H. King	Athens
North Carolina	Leon Allen	Roanoke Rapids
North Dakota	Edwin L. Shimmin	Forbes
Ohio	David G. Brubaker	South Point
*Oklahoma	Don Jeans	Ponca City
Oregon	Bob Jones	LaGrande
Rhode Island	Lauren Clauson (Boy)	East Greenwich
South Carolina	JoAnn Gibbs	Laurens
South Dakota	Karel Engel (Girl)	Aurora
Tennessee	Margaret Louise Thompson	Trenton
Texas	Jo Beth Stubblefield	Hale Center
Vermont	Dexter Lee Wilson (Boy)	Danville
Virginia	Lynn Spradlin (Boy)	Vinton
*Washington	Merwyn Eshelman (Boy)	Centerville
West Virginia	John Edgar Smith	W. Alexander, Pa.
Wisconsin	Rozel Shaaland (Boy)	Viroqua
Wyoming	Sylvan E. Brown (Boy)	Laramie
†Hawaii	Wilfred Nishina	Holualoa
†Puerto Rico	Alberto Rodriguez	Bayamon

** Denotes National Winner*
† Received $100 Bond instead of trip to Club Congress.

been president of the Federation for three years, secretary for two and recreation chairman for one year. He plans to attend college and make a career of farming—an area in which he has received vast experience on his father's 610-acre farm.

Don Jeans, 17, of Ponca City, Oklahoma, has spent five of his nine years in 4-H participating in the Electric Program. An electric hayloader and electric

The new dual-purpose Dempster Convert-o-jetmaster water system allows you to change from shallow-well to deep well (down 90 ft.) operation at little cost—*regardless of most water conditions.* Long-life, stuffing box filters out abrasive particles. Removable bronze sleeve stops wear on motor shaft for added years of trouble-free service. Choice of powerful ½ H. P. or thrifty ⅓ H. P. motor. Delivers up to 835 gals. per hour.

- Better seal—friction free, more pumping power
- Cost-free conversion—all is furnished except pipe.

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600 South 6th St Beatrice, Nebraska

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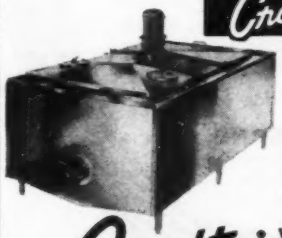
FOLEY MFG. CO., 117-7 Foley Bldg., Minneapolis 18, Minn.



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lamps are some of the equipment he has made. Don has also assisted in the wiring of all the buildings on his father's 820-acre farm. In other 4-H projects, he has been state champion sheep shearer, and state champion tractor driver.

He has held the office of president, vice president, song leader and game leader in the local club as well as the presidency of the county organization and the state's Northwest District group. A winner of 11 medals in various types of competition, Don was high individual on the first team judging Northwest Livestock Show in Denver. He was also high individual judge at the Oklahoma City Livestock Show. Don plans to enter Oklahoma A & M after graduation from high school and go into the extension service as his life's work.

Merwyn Eshelman, 17, of Centerville, Washington, has made more than $4,000 through various 4-H projects he has completed, including tractor repairs, installing a gasoline tank with electric pump and building a stock pond. Merwyn's parents have a 600-acre farm and Merwyn rents 160 of these acres.

He is a 4-H junior leader and president of the electric club. Among his electrical projects are building a room ventilating fan, trouble lamp, electric motor, continuity tester, four pig brooders and 15 lamb brooders, an electrically heated stock watering trough and an electric hotbed.

He has won 17 blue ribbons at county and state fairs, and has given demonstration of splices, magnetic fields, proper lighting and switch panels. Merwyn will give a demonstration of tractor safety at the annual meeting of the Washington State Horticultural Society next month. A senior at Goldendale High School, he plans to attend Washington State College, where he will study either electrical or agricultural engineering. □□

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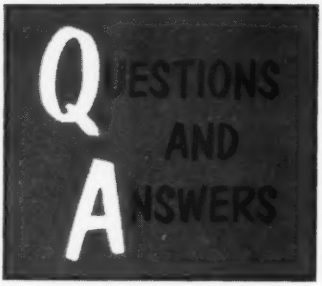

Infrared Heat for Pigs

▶**Question:** *Could we use infrared heat lamps satisfactorily and economically for only one or two baby pigs which we intend to raise for meat?*

L. D. T., Indiana

▶**Answer:** One 250-watt infrared lamp will work very satisfactorily for the purpose you have in mind. Such a lamp, if burned continuously, would use only 6 KWHrs. a day. It would be even more economical if controlled with a thermostat so as to be on only when needed. An alternative would be to change to a lower wattage lamp (125-watt) as warmer conditions occur and after the pigs get larger and require less heat.

Foot-Candle Explained

▶**Question:** *Occasionally I run across the term "foot-candle" in various pieces of literature on lighting. How much light is a foot-candle?*

C. M., Ohio

▶**Answer:** This is the unit by which scientists measure light intensity or the amount of light falling on a surface. If a light source of one candle power shines on a flat surface one foot away and directly facing the light source, the surface receives one foot-candle of illumination or light. Foot-candles can be measured with an instrument called a light meter. Different tasks require different amounts of light. 50 foot-candles on a desk is considered adequate for study purposes.

1957 BUYER'S GUIDE

Farm Production Equipment & Home Appliances

An index of manufacturers' products which have been advertised in this magazine during the past year. For further information or the name of your nearest dealer, write directly to the manufacturer, mentioning that you obtained his name from Electricity on the Farm Magazine.

NOTE: Complete addresses of all manufacturers listed can be found on pages 32 and 33.

Dairy and Livestock Chore Equipment

Barn Cleaner
Badger Northland, Inc.
Berg Equipment Co.
Clay Equipment Corp.
The Farmway Co.
James Manufacturing Co.
Louden Machinery Co.
Patz Company
Starline, Inc.
Terre Hill Machine Co., Inc.

Bottle Washer
Creamery Package Mfg. Co.

Bottling Machine
Creamery Package Mfg. Co.

Branding Iron
Automatic Equipment Mfg. Co.
L. & H. Manufacturing Co.

Brooder, Lamb
Lyon Rural Electric Co.
Rhinehart Mfg. Co., Inc.

Brooder, Pig
Lyon Rural Electric Co.
Rhinehart Mfg. Co., Inc.

Clippers or Shears, Animal
Creamery Package Mfg. Co.
John Oster Mfg. Co.
Sunbeam Corp.

Cow Trainer
Clay Equipment Corp.
Richardson Electric Co.

Cream Separator
DeLaval Separator Co.

Dehorner
Rhinehart Mfg. Co., Inc.
Sunbeam Corp.

Drinking Cup, Cattle
Berg Equipment Co.
Clay Equipment Corp.
Gardner Manufacturing Co.
James Mfg. Co.
Louden Machinery Co.
Rhinehart Mfg. Co., Inc.

Feeder, Mechanical Cattle
American Planter Co.
Clay Equipment Corp.
H. C. Davis Sons' Mill Machinery Co.
Farmer Feeder Co., Inc.
James Mfg. Co.
Railoc Company, Inc.
Starline, Inc.
Terre Hill Machine Co., Inc.
VanDale Farm Machines, Inc.
R. M. Wade & Co.

Fence Electric Controller
Babson Bros. Co.
Electric Service Systems, Inc.
Electro-Line Products Corp.
Electronic Specialties Co.
Gardenhour Mfg. Co.
Shox-Stock, Inc.

Groomer
Sunbeam Corp.

Heater, Liquid Immersion
Lyon Rural Electric Co.
Edwin L. Wiegand Co.

Heater, Milk House
Burnham Corp.
Creamery Package Mfg. Co.
Electromode, Div. of Commercial Controls Corp.
The Schlueter Co.
Edwin L. Wiegand Co.

Heater, Stock Tank
Automatic Equipment Mfg. Co.
Quinn Wire & Iron Works
Rhinehart Mfg. Co., Inc.
The Smith-Gates Corp.
Edwin L. Wiegand Co.

Lamp, Bactericidal
General Electric Co. Lamp Division
Sylvania Electric Products, Inc.

Lamp, Infrared
General Electric Co. Lamp Division
Lyon Rural Electric Co.
Rhinehart Mfg. Co., Inc.
Sylvania Electric Products, Inc.
Edwin L. Wiegand Co.

Milk Cooler, Can
DeLaval Separator Co.

Milk Handling Equip., Bulk
Babson Bros. Co.
Craft Cooler Corp.
Creamery Package Mfg. Co.
DeLaval Separator Co.
James Mfg. Co.
The Schlueter Co.
Emil Steinhorst & Sons, Inc.
United States Steel Corp.
Wilson Refrigeration

Milk Cooler Bulk
Craft Cooler Corp.
Creamery Package Mfg. Co.
DeLaval Separator Co.
James Manufacturing Co.
Emil Steinhorst & Sons, Inc.
Wilson Refrigeration Inc.

Milking Machine
Babson Bros. Co.
DeLaval Separator Co.
Farmer Feeder Co., Inc.

Pasteurizer, Commercial Dairy
Creamery Package Mfg. Co.

Pig Nurser
Norwood Products Co., Div. of
A. R. Wood Mfg. Co.

Pump, Liquid Manure
Barnes Mfg. Co.
The Deming Co.
L. R. H. Labaw & Co.
R. M. Wade & Co.

Silage Unloader
Badger Northland, Inc.
Berg Equipment Co.
Clay Equipment Corp.
The Farmway Co.
James Mfg. Co.
Louden Machinery Co.
Patz Co.
Railoc Co., Inc.
Starline, Inc.
Terre Hill Machine Co., Inc.
VanDale Farm Machines, Inc.

Sprayer, Insecticide
Automatic Equipment Mfg. Co.
The Campbell-Hausfeld Co.
F. E. Myers & Bro. Co.

Ventilator, Milk House or Barn
Aerovent Fan & Equip., Inc.
Berg Equipment Co.
Clay Equipment Corp.
Gardner Mfg. Co.
Hartzell Propeller Fan Co.
James Mfg. Co.
Louden Machinery Co.
Norwood Products Co., Div. of
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Richardson Electric Co.
The Smith-Gates Corp.

Water Heater, Milk House
Babson Bros. Co.
Creamery Package Mfg. Co.
DeLaval Separator Co.
Fairbanks, Morse & Co.
John A. Martin and Co.
Monarch Range Co.
The Schlueter Co.
Edwin L. Wiegand Co.

Waterers, Automatic Stock
Clay Equipment Corp.
Fairbanks, Morse & Co.
Fairfield Engineering Co.
Farmer Feeder Co., Inc.
James Mfg. Co.
Nelson Mfg. Co.
Quinn Wire & Iron Works
Rhinehart Mfg. Co., Inc.
Ritchie Mfg. Co.

Poultry Equipment

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Leahy Manufacturing Co.
Lyon Rural Electric Co.

Brooder, Hover
L. H. Bailey & Sons
James Mfg. Co.
Lyon Rural Electric Co.
Norwood Products Co., Div. of
A. R. Wood Mfg. Co.

Brooder, Infrared
Lyon Rural Electric Co.
Norwood Products Co., Div. of
A. R. Wood Mfg. Co.
Rhinehart Mfg. Co., Inc.

Caponizer
H. Beuoy & Son

Cleaner, Poultry House
James Mfg. Co.

Debiller
H. Beuoy & Son
Lyon Rural Electric Co.

Egg Candler
Lyon Rural Electric Co.
Rhinehart Mfg. Co., Inc.

Egg Cooler
James Mfg. Co.
Leahy Manufacturing Co.
Rhinehart Mfg. Co., Inc.

Egg Grader
Rhinehart Mfg. Co., Inc.

Egg Washer, or Cleaner
The Whirl-A-Way Corp.

Feeder, Automatic
American Planter Co.
James Mfg. Co.

Heater, Liquid Immersion
Lyon Rural Electric Co.
Rhinehart Mfg. Co., Inc.
Edwin L. Wiegand Co.

Humidifier, Egg Room
Lyon Rural Electric Co.

Incubator
James Mfg. Co.
Leahy Mfg. Co.
Lyon Rural Electric Co.

Lamp, Bactericidal
Sylvania Electric Products, Inc.

Lamp, Infrared
General Electric Co.,
Lamp Division
Lyon Rural Electric Co.
Rhinehart Mfg. Co., Inc.
Sylvania Electric Products, Inc.
Edwin L. Wiegand Co.

Switch, Light Response
Lyon Rural Electric Co.

Time Clock
James Mfg. Co.
Lyon Rural Electric Co.
Paragon Electric Co.
Tork Time Controls, Inc.

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Aerovent Fan & Equip., Inc.
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Hartzell Propeller Fan Co.
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Lyon Rural Electric Co.
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The Smith-Gates Corp.
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Miller Mfg. Co.
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Rhinehart Mfg. Co., Inc.
Ritchie Mfg. Co.
The Smith-Gates Corp.

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American Crop Drying Equip. Co.
A. T. Ferrell & Co.

Bin, Grain Drying
Aerovent Fan & Equip., Inc.
American Crop Drying Equip. Co.
Hartzell Propeller Fan Co.
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A. T. Ferrell & Co.
Hartzell Propeller Fan Co.
Louden Machinery Co.
Martin Steel Products Corp.

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J. W. Hance Mfg. Co.
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J. W. Hance Mfg. Co.

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Dormeyer Corp.
John Oster Mfg. Co.
Pioneer Gen-E-Motor Corp.
Sunbeam Corp.
Thor Power Tool Co.

Drill, Press
Sunbeam Corp.
Thor Power Tool Co.

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Thor Power Tool Co.

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Thor Power Tool Co.

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John Oster Mfg. Co.
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Heater, Pump House
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The Smith-Gates Corp.
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Edwin L. Wiegand Co.

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Dempster Mill Manufacturing Co.
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Jacuzzi Bros., Inc.
L. R. H. Labaw & Co.
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Peerless Pump Division, F.M.C.
The Tait Mfg. Co.
Universal Mfg. Co.

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General Electric Co., Wiring Device Dept.
National Electric Products Corp.
The Plastic Wire & Cable Corp.

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Dormeyer Corp.

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Sunbeam Corp.
Westinghouse Electric Corp.

Blender
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John Oster Mfg. Co.
Sunbeam Corp.

Bottle Warmer
Sunbeam Corp.

Bulbs & Tubes, Lighting
General Electric Co. Lamp Division
Sylvania Electric Products, Inc.

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Sunbeam Corp.

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Clippers, Hedge
Sunbeam Corp.

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Gardenhour Mfg. Co.

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Hotpoint Co.
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Westinghouse Electric Corp.

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Hotpoint Co.
Kelvinator, Div. American Motors Corp.
Westinghouse Electric Corp.

Coffeemaker
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Sunbeam Corp.
Westinghouse Electric Corp.

Dehumidifiers
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Westinghouse Electric Corp.

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Hotpoint Co.
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Westinghouse Electric Corp.

Egg Cooker
Dormeyer Corp.
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The Smith-Gates Corp.
Westinghouse Electric Corp.

Fan, Furnace
Dayton Electric Mfg. Co.

Fan, Portable
Dayton Electric Mfg. Co.
Westinghouse Electric Corp.

Fan, Window
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Westinghouse Electric Corp.

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Westinghouse Electric Corp.

Flour Mill
Lee Engineering Co.

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Dormeyer Corp.
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Sunbeam Corp.
Westinghouse Electric Corp.

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Hotpoint Co.
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Westinghouse Electric Corp.

Fry Pan
Dormeyer Corp.
Sunbeam Corp.
Toastmaster Products, Div. McGraw Electric Co.
Westinghouse Electric Corp.

Fryer, Deep Fat
Dormeyer Corp.
Sunbeam Corp.
Westinghouse Electric Corp.

Garbage Disposer
Hotpoint Co.
Kelvinator, Div. American Motors Corp.
Westinghouse Electric Corp.

Grills
Kelvinator, Div. American Motors Corp.
Toastmaster Products, Div. McGraw Electric Co.

Hair Dryer
John Oster Manufacturing Co.
Sunbeam Corp.

Heater, Space
Burnham Corp.
Electromode, Division of Commercial Controls Corp.
Edwin L. Wiegand Co.

Heating Pad
Westinghouse Electric Corp.

Home Drink Mixer
Hamilton Beach, Div. of Scovill Mfg. Co.

Hot Plate
Gardenhour Mfg. Co.
Westinghouse Electric Corp.
Edwin L. Wiegand Co.

Iron, Dry or Steam
Dormeyer Corp.
Sunbeam Corp.
Toastmaster Products, Div. McGraw Electric Co.
Westinghouse Electric Corp.

Ironer
Kelvinator, Div. American Motors Corp.

Lamp Bulb, Health & Sun
General Electric Co. Lamp Division
Sylvania Electric Products, Inc.

Lawn Mower
Fairbanks, Morse & Co.
Sunbeam Corp.

Meat Grinder
Dormeyer Corp.
Hamilton Beach, Div. of Scovill Mfg. Co.
John Oster Mfg. Co.
Sunbeam Corp.

Pasteurizer, Home Milk
Electronic Specialties Co.
The Schlueter Co.
Waters Conley Co., Inc.

Pump, Cellar Drain
Baker Manufacturing Co.
Barnes Manufacturing Co.
Dayton Electric Mfg. Co.
The Deming Co.
Dempster Mill Mfg. Co.
Fairbanks, Morse & Co.
Flint & Walling Mfg. Co., Inc.
Goulds Pumps, Inc.
Jacuzzi Bros., Inc.
L. R. H. Labaw Co.
A. Y. McDonald Mfg. Co.
F. E. Myers & Bro. Co.
Peerless Pump Div., F.M.C.
The Tait Mfg. Co.
Universal Mfg. Co.

Range, Combination
Monarch Range Co.

Range, Electric
Hotpoint Co.
Kelvinator, Div. American Motors Corp.
Monarch Range Co.
The Tappan Stove Co.
Westinghouse Electric Corp.

Range, Electronic
The Tappan Stove Co.

Refrigerator
Hotpoint Co.
Kelvinator, Div. American Motors Corp.
Westinghouse Electric Corp.

Roaster
Westinghouse Electric Corp.

Rotisserie
Dormeyer Corp.
Westinghouse Electric Corp.

Sewing Machine
Singer Sewing Machine Co.

Shaver, Electric
Sunbeam Corp.

Slicer, Food
Sunbeam Corp.

Television
Hotpoint Co.

Toaster
Dormeyer Corp.
Hamilton Beach, Div. of Scovill Mfg. Co.
Sunbeam Corp.
Toastmaster Products, Div. McGraw Electric Co.
Westinghouse Electric Corp.

Toilet, Electric Flushing
McPherson, Inc.

Vaccum Cleaner
Hamilton Beach, Div. of Scovill Mfg. Co.
Singer Sewing Machine Co.
Westinghouse Electric Corp.

Waffle Iron
Sunbeam Corp.
Toastmaster Products, Div. McGraw Electric Co.
Westinghouse Electric Corp.

Water Closet, Frost Proof
Joseph A. Vogel Co.

Water Filter, Iron
Fairbanks, Morse & Co.
Oshkosh Filter & Softener Co.
The Tait Mfg. Co.

Water Heater
DeLaval Separator Co.
Fairbanks, Morse & Co.
Hotpoint Co.
Kelvinator, Div. American Motors Corp.
Monarch Range Co.
Sepco Corp.
Westinghouse Electric Corp.

Water Purifier
Oshkosh Filter & Softener Co.
Sepco Corp.

Water Softener
Fairbanks, Morse & Co.
F. E. Myers & Bro. Co.
Oshkosh Filter & Softener Co.
The Schlueter Co.
The Tait Mfg. Co.

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Listed in WHERE TO BUY SECTION

For Advertisers in this issue see Advertising Index on page 34

Aerovent Fan & Equipment, Inc.,
P. O. Box 9007, Lansing, Mich.

Alabama Mfg. Co.,
1st Ave. North at 13th St., Birmingham 3, Ala.

American Crop Drying Equipment Co.,
Crystal Lake, Ill.

American Planter Co.,
Burr Oak, Mich.

Anaconda Wire & Cable Co.,
25 Broadway, New York 4, N. Y.

Automatic Equipment Mfg. Co.,
Pender, Nebr.

Babson Brothers Co.,
2843 W. 19th St., Chicago 23, Ill.

Badger Northland, Inc.,
Kaukauna, Wis.

L. H. Bailey & Sons,
P. O. Box 106, Athens, Ga.

Baker Mfg. Co.,
133 Enterprise St., Evansville, Wis.

Barnes Manufacturing Co.,
651 North Main St., Mansfield, Ohio

The C. S. Bell Co.,
Hillsboro, Ohio

Belle City Engineering Co.,
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Ben Hur Mfg. Co.,
634 E. Keefe Ave., Milwaukee 12, Wis.

Berg Equipment Co.,
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The Campbell-Hausfeld Co.,
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Century Electric Co.,
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Clay Equipment Corp.,
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Columbiana Pump Co.,
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Dayton Electric Mfg. Co.,
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General Electric Co., Medium Induction Motor Dept.,
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Hamilton Beach Co.,
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J. W. Hance Mfg. Co.,
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Horvick Mfg. Co.,
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Hotpoint Company,
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Insect Electrocutor Co.,
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L. & H. Manufacturing Co.,
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The Louden Machinery Co.,
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Lyon Rural Electric Co.,
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F. E. Myers & Bro. Co.,
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National Rainbird Sales & Engr. Corp.,
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Pound, Wis.
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Jewett City, Conn.

Quinn Wire & Iron Works,
Box No. 549, Boone, Iowa

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Railoc Company, Inc.,
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The Tappan Stove Co.,
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Wincharger Corp.,
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Wrap-On Company,
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Whenever you need further information about electrical equipment and appliances, you can depend upon the Manufacturers who are advertising in this magazine. Listed above are the 41 Manufacturers whose advertising appears in this January issue. On the preceding page you will find the names and addresses of 131 Manufacturers who are currently demonstrating their interest in helping you through advertising in this specialized magazine.

When writing to these manufacturers be sure to mention you saw their advertising in ELECTRICITY ON THE FARM Magazine.

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Just fill in and mail the coupon below, or use a similar form, and we will provide the names of manufacturers and when possible will have these manufacturers send you descriptive literature.

ELECTRICITY ON THE FARM 1-57

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How heating cable in portable floor slabs is used in brooding chickens and turkeys

Electric Hybrid Corn Processing

How conveyors, driers, shellers and graders process thousands of bushels of hybrid seed corn efficiently

Proper Wiring Sizes for Motors

Typical problem involving a farm motor—and the solution

Successful Poultry Farming with Electricity

Mechanical feeders, egg cleaners, egg room coolers, hover type brooders and time-controlled lighting are all a part of this story—a case history of a profitable poultry enterprise in California

Electric Ironers

Why and how ironing by electricity is far superior to old fashioned methods

Electric Coffeemakers

A review of the many types of electric coffeemakers available to you—from a two-cup "espresso" type to a 50-cup percolator

Infrared Lamps

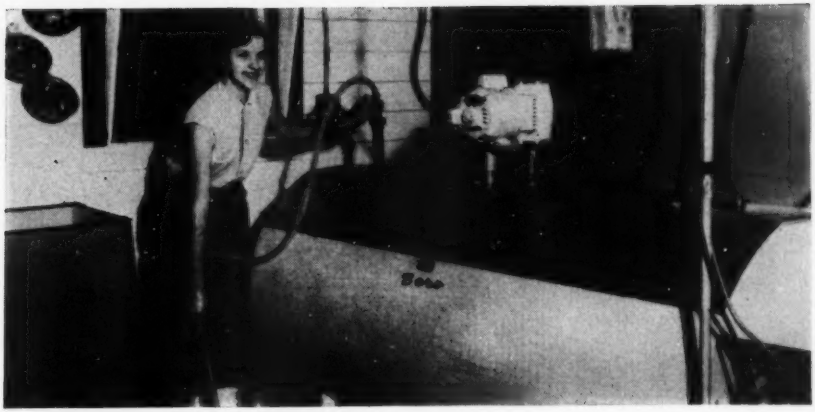
Comprehensive treatment of the wide variety of uses for infrared lamps around the farm

Curing Hams with Electricity

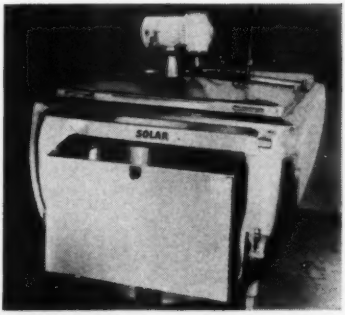
How an FFA group built an electric smokehouse

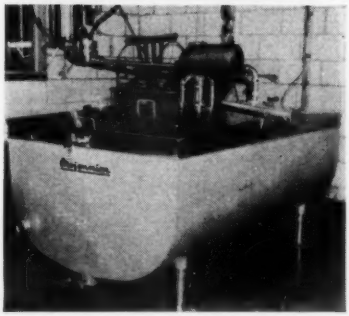
Homemaking and Electricity

Presenting the national 4-H winners in canning, freezing, sewing and food preparation



Money-Making New Cow-to-Tank Milk Coolers depend on





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Farm-Tested MOTORS

No more milk cans for dairymen who use these sensational new Bulk Milk Coolers. By pulling the milk directly into the cooling tank, bacteria counts are kept much lower . . . butterfat content is preserved. Milk can be stored for days without loss of quality.

When you're in the market for one of these wonderful new coolers, be sure to look for one with a genuine Century Gearmotor mounted on the top. This motor turns the agitator that aids in chilling the milk quickly and evenly. The Century Farm-Tested Milk Cooler Motor has a "streamlined" cover . . . easy to clean . . . even when you wash down your milkhouse. It's designed to prevent contamination of milk from oil leakage.

The leading manufacturers of Bulk Milk Coolers insist on Century Motors. When you see the red "C", you know you're getting the best . . . by Farm Test!

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1/20 to 400 H.P.

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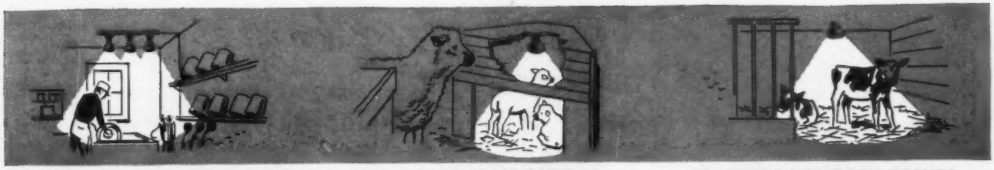
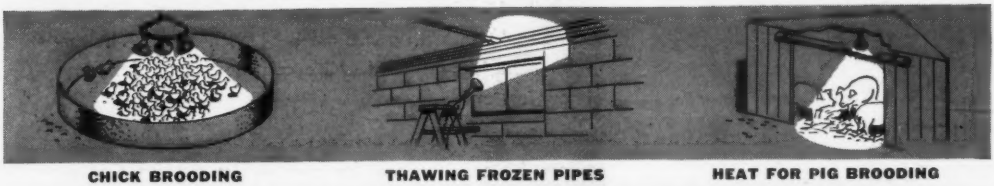
do scores of chores



COMFORT IN THE MILK HOUSE | HEAT FOR LAMBS | WARMING NEWBORN CALVES



CHICK BROODING | THAWING FROZEN PIPES | HEAT FOR PIG BROODING

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